IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): A network system, comprising:

a radio terminal having a first communication interface usable for reception only and a second communication interface usable for transmission and reception;

a first sub-network to which the radio terminal is connected through a radio base station of a downlink radio network by using the first communication interface;

a second sub-network to which the radio terminal is connected through a bidirectional communication network by using the second communication interface, the second sub-network being connected with the first sub-network through a backbone network; and

a packet relay device, located in the first sub-network, configured to receive a request message requesting a protocol processing ~~with respect to~~ for retrieving data from and/or sending data to the first sub-network from the radio terminal through the second sub-network, and carry out the protocol processing on the first sub-network according to the request message on behalf of the radio terminal, such that a response message corresponding to the request message obtained by the protocol processing is returned from the first sub-network to the radio terminal through the downlink radio network or the bidirectional communication network, the request message being transmitted through the first communication interface and then broadcast, multicast or unicast on the first sub-network when the radio terminal is capable of transmitting data to the first sub-network through the first communication interface,

wherein the radio terminal is configured to receive a notification message indicating ~~an existence or~~ an address of the packet relay device on the first sub-network through the downlink radio network by using the first communication interface when the radio terminal

enters a radio area of the radio base station, and is configured to transmit the request message after receiving the notification message at the first communication interface, and

the radio terminal is further configured to process the response message received by the first or second communication interface.

Claim 2 (Previously Presented): The network system of claim 1, wherein the radio terminal is configured to transmit the request message after receiving the notification message at the first communication interface, by encapsulating the request message into an IP (Internet Protocol) packet destined to the address of the packet relay device obtained according to the notification message and transmitting the IP packet from the second communication interface;

the packet relay device is configured to decapsulate the IP packet received from the radio terminal through the second sub-network, carry out the protocol processing on behalf of the radio terminal according to the request message taken out from the IP packet, and transmit the response message in a form of such a prescribed packet that is received by the second communication interface of the radio terminal through the second sub-network; and

the radio terminal is configured to process the response message contained in the prescribed packet.

Claims 3 and 4 (Canceled).

Claim 5 (Currently Amended): The packet relay device of claim ~~3~~ 21, wherein the communication interface is configured to transmit the response message by rewriting a destination address of the response message into an IP (Internet Protocol) address acquired by the radio terminal at a second sub-network side.

Claim 6 (Currently Amended): The packet relay device of claim ~~3~~ 21, wherein the communication interface is configured to transmit the response message by encapsulating the response message into an IP (Internet Protocol) packet destined to an IP address acquired by the radio terminal at a second sub-network side.

Claim 7 (Currently Amended): The packet relay device of claim ~~3~~ 21, wherein when the request message is a DHCP (Dynamic Host Configuration Protocol) request message, the processing unit transmits the DHCP request message to the first sub-network and receives a DHCP response message from a DHCP server that processed the DHCP request message.

Claim 8 (Canceled).

Claim 9 (Currently Amended): The radio terminal of claim ~~8~~ 22, wherein the second communication interface is also configured to receive the response message transmitted from the packet relay device through the second sub-network.

Claim 10 (Currently Amended): The radio terminal of claim ~~8~~ 22, wherein when the response message is an encapsulated IP packet, the second communication interface decapsulates the encapsulated IP packet so as to take out the response message and gives the response message taken out from the encapsulated IP packet to the processing unit.

Claim 11 (Currently Amended): The radio terminal of claim ~~8~~ 22, wherein the notification message is provided in a form of a specific message to be regularly transmitted by the radio base station or a specific node provided in the first sub-network, and the first

communication interface is configured to acquire information indicating the existence or the address of the packet relay device by receiving the specific message regularly transmitted by the radio base station or the specific node.

Claim 12 (Currently Amended): The radio terminal of claim ~~8~~ 22, wherein the second communication interface transmits the request message in a form of a broadcast packet with respect to the first sub-network or a multicast packet with respect to a prescribed group of nodes on the first sub-network.

Claim 13 (Currently Amended): The radio terminal of claim ~~8~~ 22, wherein the second communication interface transmits the request message which is any one of a DHCP (Dynamic Host Configuration Protocol) request message with respect to the first sub-network, a router solicitation message with respect to the first sub-network, an IGMP (Internet Group Management Protocol) report message with respect to a multicast router on the first sub-network, an ARP (Address Resolution Protocol) response message with respect to the first sub-network, and an SLP (Service Location Protocol) request message with respect to the first sub-network.

Claim 14 (Previously Presented): The radio terminal of claim 13, wherein when the request message is the DHCP request message, upon receiving a DHCP response message corresponding to the DHCP request message, the processing unit sets the second communication interface as a transmission interface and the first communication interface as a reception interface with respect to an IP (Internet Protocol) address allocated to the radio terminal on the first sub-network that is contained in the DHCP response message.

Claim 15 (Canceled).

Claim 16 (Currently Amended): The method of claim ~~15~~23, wherein after receiving the notification message at the first communication interface, the request message is encapsulated by the radio terminal into an IP (Internet Protocol) packet destined to the address of the packet relay device obtained according to the notification message and the IP packet is transmitted from the second communication interface;

the IP packet received from the radio terminal through the second sub-network is decapsulated at the packet relay device and the protocol processing is carried out on behalf of the radio terminal according to the request message taken out from the IP packet at the packet relay device;

the response message in a form of such a prescribed packet that is received by the second communication interface of the radio terminal is returned through the second sub-network from the packet relay device to a radio terminal; and

the response message contained in the prescribed packet received by the second communication interface is processed at the radio terminal.

Claims 17-20 (Canceled).

21. (New) A packet relay device located in a first sub-network and comprising;

a communication interface configured to receive an encapsulated IP packet including a request message requesting a protocol processing for retrieving data from and/or sending data to the first sub-network, which is transferred from a radio terminal through a second sub-network wherein the radio network is connected to the first sub-network and the second sub-network through a radio base station of a downlink radio network and a bidirectional

communication network respectively, and the second sub-network is connected with the first sub-network through a backbone network, and the request message is transmitted through the first communication interface and then broadcast, multicast or unicast on the first sub-network when the radio terminal is capable of transmitting data to the first sub-network through the first communication interface; and

a processing unit configured to decapsulate the encapsulated IP packet received by the communication interface so as to take out the request message, and carry out the protocol processing on the first sub-network according to the request message on behalf of the radio terminal,

wherein the communication interface is also configured to transmit a response message corresponding to the request message obtained by the protocol processing as an encapsulated I? packet to be received by the radio terminal through the downlink radio network or the bidirectional communication network.

22. (New) A radio terminal comprising:

a first communication interface configured to be connected to a first sub-network through a radio base station of a downlink radio network and **to** receive a notification message indicating an address of a packet relay device located in the first sub-network when the radio terminal enters a radio area of the radio base station;

a second communication interface configured to be connected to a second sub-network through a bidirectional communication network and to encapsulate a request message requesting a protocol processing for retrieving data from and/or sending data to the first sub-network into an IP (Internet Protocol) packet destined to the address of the packet relay device obtained according to the notification message and transmit the IP packet to the packet relay device through the second sub-network wherein the second sub-network is

connected with the first sub-network through a backbone network and the request message is transmitted through the first communication interface and then broadcast, multicast or unicast on the first sub-network when the radio terminal is capable of transmitting data to the first sub-network through the first communication interface; and

a processing unit configured to process a response message corresponding to the request message obtained by the protocol processing, the response message being returned from the packet relay device through the downlink radio network or the bidirectional communication network.

23. (New) A packet processing method comprising:

receiving a notification message indicating an address of a packet relay device located in a first sub-network when a radio terminal enters a radio area of a radio base station wherein a first communication interface of the radio terminal is connected to the first sub-network through the radio base station of a downlink radio network;

transmitting a request message requesting a protocol processing for retrieving data from and/or sending data to the first sub-network from the radio terminal to the packet relay device through a second sub-network wherein a second communication interface of the radio terminal is connected to the second sub-network through a bidirectional communication network, and the second sub-network is connected with the first sub-network through a backbone network, and the request message is transmitted through the first communication interface and then broadcast, multicast or unicast on the first sub-network when the radio terminal is capable of transmitting data to the first sub-network through the first communication interface:

receiving the request message and carrying out the protocol

processing on the first sub-network according to the request message on behalf of the radio terminal at the packet relay device;

returning a response message corresponding to the request message obtained by the protocol processing from the first sub-network to the radio terminal through the downlink radio network or the bidirectional communication network; and

processing the response message received by the second communication interface at the radio terminal.

24. (New) A packet processing method at a packet relay device located in a first sub-network, the method comprising:

receiving an encapsulated IP packet including a request message requesting a protocol processing for retrieving data from and/or sending data to the first sub-network, which is transferred from a radio terminal through a second sub-network wherein the radio network is connected to the first sub-network and the second sub-network through a radio base station of a downlink radio network and a bidirectional communication network respectively, arid the second sub-network is connected with the first sub-network through a backbone network, and the request message is transmitted through the first communication interface and then broadcast, multicast or unicast on the first sub-network when the radio terminal is capable of transmitting data to the first sub-network through the first communication interface;

decapsulating the encapsulated IF packet received by the receiving step so as to take out the request message, and carrying out the protocol processing on the first sub-network according to the request message on behalf of the radio terminal; and

transmitting a response message corresponding to the request message obtained by the protocol processing as an encapsulated TP packet to be received by the radio terminal

through the downlink radio network or the bidirectional communication network.

25. (New) A packet processing method at a radio terminal, comprising;

receiving a notification message indicating an address of a packet relay device located in a first sub-network when the radio terminal enters a radio area of a radio base station, using a first communication interface connected to the first sub-network through the radio base station of a downlink radio network;

encapsulating a request message requesting a protocol processing for retrieving data from and/or sending data to the first sub-network into an IP (Internet Protocol) packet destined to the address of the packet relay device obtained according to the notification message and transmitting the IP packet to the packet relay device, using a second communication interface connected to a second sub-network through a bidirectional communication network wherein the second sub-network is connected with the first sub-network through a backbone network and the request message is transmitted through the first communication interface and then broadcast, multicast or unicast on the first sub-network when the radio terminal is capable of trarisntitting data to the first sub-network through the first communication interface; and

processing a response message corresponding to the request message obtained by the protocol processing, the response message being returned from the packet relay device through the downlink radio network or the bidirectional communication network.

26. (New) A computer usable medium having computer readable program codes embodied therein for causing a computer to function as a packet relay device located in a first sub-network, the computer readable program codes comprising:

a first computer readable program code for causing said computer to receive an

encapsulated IP packet including a request message requesting a protocol processing for retrieving data from and/or sending data to the first sub-network, which is transferred from a radio terminal through a second sub-network wherein the radio network is connected to the first sub-network and the second sub-network through a radio base station of a downlink radio network and a bidirectional communication network respectively, and the second sub-network is connected with the first sub-network through a backbone network, and the request message is transmitted through the first communication interface and then broadcast, multicast or unicast on the first sub-network when the radio terminal is capable of transmitting data to the first sub-network through the first communication interface;

a second computer readable program code for causing said computer to decapsulate the encapsulated I? packet received by the receiving step so as to take out the request message, and carry out the protocol processing on the first sub-network according to the request message on behalf of the radio terminal:

and

a third computer readable program code for causing said computer to transmit a response message corresponding to the request message obtained by the protocol processing as an encapsulated I? packet to be received by the radio terminal through the downlink radio network or the bidirectional communication network.

27. (New) A computer usable medium having computer readable program codes embodied therein for causing a computer to function as at a radio terminal, the computer readable program codes comprising:

a first computer readable program code for causing said computer to receive a notification message indicating an address of a packet relay device located in a first sub-network when the radio terminal enters a radio area of a radio base station, using a first

communication interface connected to the first sub-network through the radio base station of a downlink radio network;

a second computer readable program code for causing said computer to encapsulate a request message requesting a protocol processing for retrieving data from and/or sending data to the first sub-network into an IF (Internet Protocol) packet destined to the address of the packet relay device obtained according to the notification message and transmit the IP packet to the packet relay device, using a second communication interface connected to a second sub-network through a bidirectional communication network wherein the second sub-network is connected with the first sub-network through a backbone network and the request message is transmitted through the first communication interface and then broadcast, multicast or unicast on the first sub-network when the radio terminal is capable of transmitting data to the first sub-network through the first communication interface; and

a third computer readable program code for causing said computer to process a response message corresponding to the request message obtained by the protocol processing, the response message being returned from the packet relay device through the downlink radio network or the bidirectional communication network.